

REMARKS

These remarks are being filed in response to the Office Action dated June 15, 2006. For the following reasons this application should be allowed and the case passed to issue.

Claims 1-11 are pending in this application. Claims 4-11 have been withdrawn pursuant to a restriction requirement. Claims 1-3 are rejected.

Restriction Requirement

The Examiner explained that in order to rejoin method claim 11 with the photomask claims, upon the allowance of the mask claims, claim 11 must be amended to conform with the mask description of claim 1. Applicants appreciate the Examiner's helpful suggestion and will consider such an amendment upon the allowance of claim 1.

Objections to the Specification

The specification was objected to because of the recited "half tone mask" in line 2 of the Abstract. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The Abstract was amended to correct this informality on page 4 of the Amendment filed April 4, 2006.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-3 are rejected under 35 U.S.C. 35 § 103(a) as obvious over Samsung Corp. (KR 1996-0031200) in view of Nakao (U.S. Pat. No. 5,858,625). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a half tone phase shift mask comprising a transparent substrate, a semitransparent film or shading film provided on the transparent

substrate, and a clear defect portion being a missing portion of a complete pattern that should be formed when it is assumed that the semitransparent film or shading film is completely well formed. A shading portion, having a transmissivity of 0 to 2% or 2 to 6%, is provided in the clear defect portion. A semitransparent portion having a transmissivity larger than that of the shading portion is formed at the peripheral portion of the shading portion.

The Examiner asserted that Samsung Corp. teaches a method of manufacturing a transmissivity-adjusting mask. The Examiner indicated that Samsung Corp. does not disclose that the semitransparent portion is formed adjacent to the shading portion with a particular direction relationship. The Examiner averred that Nakao teaches the treatment of defects in phase shift masks which includes the use of a semi-light shielding film and attenuated transmitting areas. The Examiner concluded that it would have been obvious to combine the teachings of Samsung Corp. and Nakao in order to make the claimed invention because the incorporation of a semitransparent feature that extends in a perpendicular direction from the main pattern would be an obvious design in the region where the optical effect of the interference of light with the main pattern is to be corrected.

The combination of Samsung Corp. and Nakao, however, does not disclose or suggest the claimed half tone phase shift mask.

While Samsung discloses a half tone phase shift mask, Samsung does not disclose the half tone phase shift mask in which a clear defect has been corrected or a method of correcting a clear defect. It would not have been obvious to one of ordinary skill in this art to combine Nakao with Samsung. While Nakao discloses a phase shift mask, the phase shift mask of Nakao is a Levenson type phase shift mask, not a half tone phase shift mask.

A Levenson type phase shift mask is formed by chemically etching a quartz substrate so as to obtain a phase shift effect. A half tone phase shift mask, on the other hand, is formed by depositing a half tone film on a quartz substrate so as to obtain a phase shift effect.

Furthermore, Nakao discloses an Optical Proximity Correction (OPC) method wherein the shape of the original pattern of a Levenson type phase shift mask itself is corrected but is silent about a method of correcting a clear defect of a half tone phase shift mask. One of ordinary skill in this art would not have been motivated by Nakao's teachings of a Levenson type phase shift mask to correct a clear defect in the half tone phase shift mask of Samsung to provide the claimed phase shift mask. When considered as a whole, the combination of Samsung and Nakao would not suggest the half tone photomask in which a clear defect has been corrected as defined by claim 1.

Obviousness can be established only by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine*, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Although a reference can be modified, the prior art must suggest the desirability of modifying a reference. See *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). There is no suggestion in Nakao teaching of a Levenson type phase shift mask to modify the half tone phase shift mask of Samsung to produce a half tone phase shift mask, as required by claim 1. Applicants submit that the section 103 rejection should be withdrawn.

"In order to rely on a reference as a basis for rejection of applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oeticker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). Nakao is neither directed to the field of Applicants' endeavor, **half tone phase shift masks**, nor pertinent to the problem with which Applicants were concerned, correcting a clear defect on a half tone phase shift mask.

The only teaching of a half tone phase shift mask comprising a clear defect portion being a missing portion of a complete pattern that should be formed when it is assumed that the semitransparent film or shading film is completely well formed, a shading portion, having a transmissivity of 0 to 2% or 2 to 6% provided in the clear defect portion, and a semitransparent portion having a transmissivity larger than that of the shading portion is formed at the peripheral portion of the shading portion is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The dependent claims are allowable for at least the same reasons as independent claim 1, and further distinguish the claimed half tone phase shift mask.

In view of the above remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Response or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Bernard P. Codd
Registration No. 46,429

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 BPC:MWE
Facsimile: 202.756.8087
Date: October 16, 2006

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